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EXAMINER	
LOO, JUVENA W	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/722,022	WHITTAKER STEWART, MARK ANDREW	
	Examiner	Art Unit	
	JUVENA LOO	2416	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 December 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14 and 16-35* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14 and 16-35* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1 – 7, 9, 12 – 14, 17 – 25, 27, 31, and 34 - 35 are rejected under 35 USC 103(a) as being unpatentable over Bertin et al. (US 6,400,681 B1) in view of Schwartz et al. (US 6,421,342 B1).

Regarding claim 1, Bertin discloses *a network, comprising*:

a master subnet manager, wherein the master subnet manager is coupled to provide network topology data (Bertin: Figure 5, a topology database);

a requested traffic pattern for a packet (Bertin: lines 47- 49 column 11 – connection request, including parameters such as origin and destination address, data flow characteristics, is specified by the user); *and*

a connection controller, wherein

the connection controller is coupled to receive the requested traffic pattern (Bertin: Figure 1, access node) *and the network topology data* (Bertin: Figure 5, topology database),

compute an actual traffic pattern for the packet (Bertin: lines 50-52 column 11 – a path and a set of requests for each link of the path are determined using parameters provided by the Topology Database; Figure 7 - all the predetermined paths, corresponds to a specific destination, are extracted from the Path Table one at a time. If the characteristics of a path satisfy the request, the path is selected when all the links in the path provide enough bandwidth. The shortest route, with dedicated bandwidth, is chosen from the selected paths. The predetermined paths are calculated based on the topology information stored in the topology database) *and*

communicate the actual traffic pattern to a source corresponding to the packet (Bertin: lines 53 - 65 column 11 - connection request is used to reserve bandwidth on every nodes (origin, transit, and destination) in the path. The transit and destination nodes answer the source/request by sending back either a call acceptance or a call reject).

However, Bertin does not explicitly disclose the feature:

the network operates as a strictly non-interfering network.

Schwartz et al. discloses an apparatus and method for forwarding packets of data comprising the feature:

the network operates as a strictly non-interfering network (Schwartz: see "With this background, the binary search…comparison trees is not constrained as described above" in column 20, line 15 through column 23, line 30; see also Figure 4 and "A functional block diagram of a switch plane…output port modules at any point in time" in column 11, lines 6 – 50).

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the system of Bertin et al. by using the feature, as taught by Schwartz, in order to allow all the input packet modules to transfer packets to any of the output port modules at any point in time, and effectively make the inter-port packet switch non-blocking (Schwartz: see column 11, lines 45 – 50).

Regarding claim 2, Bertin discloses *the connection controller comprises a packing algorithm, wherein the packing algorithm utilizes the requested traffic pattern and the network topology data to compute the actual traffic pattern* (Bertin: Figure 7 - all the predetermined paths, corresponds to a specific destination, are extracted from the Path Table one at a time. If the characteristics of a path satisfy the request, the path is selected when all the links contain enough bandwidth. The shortest route, with dedicated bandwidth, is chosen from the selected paths. The predetermined paths are calculated based on the topology information stored in the topology database).

Regarding claim 3, Bertin discloses *the network further comprises a plurality of switches* (Bertin: Figure 2), *and wherein the connection controller*:

calculates a plurality of routing trees for the plurality of switches (Bertin: Figure 9, line 51 column 19 to line 29 column 20; Figure 10, line 32 column 20 to line 4 column 21; and Figure 11, lines 7-33 column 21. The Routing Database and the Topology Database are scanned periodically for identifying new paths or for updating existing ones);

calculates a plurality of Destination Location Identifiers (DLID) and a set of forwarding instructions for each of the plurality of switches (Bertin: line 59 column 12 to line 23 column 13 – Equivalent Capacity of the network connection is first computed. Next, all potential paths through the network, based on the information stored in the Topology Database, are determined. The algorithm constructs the new potential path by adding one link at a time and ensuring that the bandwidth and quality of services requirements are still met), *wherein*

each of the plurality of DLIDs corresponds to one of the plurality of routing trees and one of a plurality of destinations in the network (Bertin: lines 37-39 column 13 – each entry in the table represents a path, between a source node and a destination node, that satisfies specific quality of service and traffic requirements); *and*

populates a forwarding table of each of the plurality of switches in the network with the plurality of DLIDs and the set of forwarding instructions (line 54 column 18 to line 26 column 19 – paths and their corresponding link information are stored in the

Path Table and Link Table respectively. The Path Table and Link Table are both part of Routing Database).

Regarding claim 4, Bertin discloses *wherein computing an actual traffic pattern comprises of executing a rearrangement algorithm* (Bertin: Figure 7 - all the predetermined paths, corresponds to a specific destination, are extracted from the Path Table one at a time. If the characteristics of a path satisfies the request, the path is selected if all its links provide enough bandwidth; furthermore, the shortest route, with dedicated bandwidth, is chosen from the selected paths); and assigning one of a plurality of DLID (Bertin: Figure 4, Path Table (410) – the selected path, with dedicated bandwidth, contains at least the destination node and the selected path).

However, Bertin does not explicitly disclose the feature:

the network operates as a strictly non-interfering network.

Schwartz et al. discloses an apparatus and method for forwarding packets of data comprising the feature:

the network operates as a strictly non-interfering network (Schwartz: see "With this background, the binary search…comparison trees is not constrained as described above" in column 20, line 15 through column 23, line 30; see also Figure 4 and "A functional block diagram of a switch plane…output port modules at any point in time" in column 11, lines 6 – 50).

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the system of Bertin et al. by using the feature, as taught by Schwartz, in order to allow all the input packet modules to transfer packets to any of the output port modules at any point in time, and effectively make the inter-port packet switch non-blocking (Schwartz: see column 11, lines 45 – 50).

Regarding claim 5, Bertin discloses *wherein the network further comprises a plurality of switches* (Bertin: Figure 2), *wherein*

the packet follows a path through at least a portion of the plurality of switches in the network (Bertin: lines 26 - 27, column 7 – incoming data packets are selectively routed onto the outgoing Trunks towards neighboring nodes), *and wherein*

each of the portion of the plurality of switches forwards the packet according to the one of the plurality of DLIDs assigned to the packet such that the network operates as a strictly non-interfering network (Bertin: lines 28 - 29, column 7 – incoming data packet is forwarded according to the routing information contained in the header of the packet; Figure 7 - all the predetermined paths, corresponds to a specific destination, are extracted from the Path Table one at a time. If the characteristics of a path satisfy the request, the path is selected when all the links in the path provide enough bandwidth. The shortest route, with dedicated bandwidth, is chosen from the selected paths. The predetermined paths are calculated based on the topology information stored in the topology database).

Regarding claim 6, Bertin discloses *wherein each of the portion of the plurality of switches looks up the one of the plurality of DLIDs assigned to the packet in a forwarding table* (Bertin: lines 28 - 29 column 7 – routing decisions are made according to the information contained in the header of the data packets).

Regarding claim 7, Bertin discloses *wherein each of the portion of the plurality of switches forwards the packet in accordance with the one of the plurality of DLIDs assigned to the packet as found in a forwarding table* (Bertin: lines 26 - 27, column 7 – incoming data packet is forwarded according to the routing information contained in the header of the packet).

Regarding claim 9, Bertin discloses *a network comprising a computer-readable medium containing computer instructions for instructing a processor to perform a method of populating a forwarding table, the instructions comprising*:

calculating a plurality of routing trees for a plurality of switches (Bertin: Figure 9, lines 51 column 19 to line 29 column 20; Figure 10, line 32 column 20 to line 4 column 21; and Figure 11, lines 7 - 33 column 21. The Routing Database and the Topology Database are scanned periodically for identifying new paths or for updating existing ones);

calculating a plurality of Destination Location Identifiers (DLID) and a set of forwarding instructions for each of the plurality of switches (Bertin: line 59 column 12 to line 23 column 13 – Equivalent Capacity of the network connection is first computed. Next, all potential paths through the network, based on the information stored in the Topology Database, are determined. The algorithm constructs the new potential path by adding one link at a time and ensuring that the bandwidth and quality of services requirements are still met), wherein

each of the plurality of DLIDs corresponds to one of the plurality of routing trees and one of a plurality of end nodes (Bertin: lines 37 - 39 column 13 – each entry in the table represents a path, between a source node and a destination node, that satisfies specific quality of service and traffic requirements); *and*

populating the forwarding table of each of the plurality of switches in the network with the plurality of DLIDs and the set of forwarding instructions (Bertin: line 54 column 18 to line 26 column 19 – paths and their corresponding link information are stored in the Path Table and Link Table respectively. The Path Table and Link Table are both part of Routing Database).

However, Bertin does not explicitly disclose the feature:

the forwarding instructions create paths appropriate to make the network operate as a strictly non-interfering network.

Schwartz et al. discloses an apparatus and method for forwarding packets of data comprising the feature:

the forwarding instructions create paths appropriate to make the network operate as a strictly non-interfering network (Schwartz: see "With this background, the binary search…comparison trees is not constrained as described above" in column 20, line 15 through column 23, line 30; see also Figure 4 and "A functional block diagram of a switch plane…output port modules at any point in time" in column 11, lines 6 – 50).

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the system of Bertin et al. by using the feature, as taught by Schwartz, in order to allow all the input packet modules to transfer packets to any of the output port modules at any point in time, and effectively make the inter-port packet switch non-blocking (Schwartz: see column 11, lines 45 – 50).

Regarding claim 12, Bertin discloses

wherein calculating the plurality of routing trees comprises for each spine node in the network (Bertin: Figure 9, lines 51 column 19 to line 29 column 20; Figure 10, line 32 column 20 to line 4 column 21; and Figure 11, lines 7-33 column 21. The Routing Database and the Topology Database are scanned periodically for identifying new paths or for updating existing ones),

calculating a shortest path from the spine node to each of the plurality of end nodes (Bertin: lines 41 - 44 column 14 – a path is calculated with as few links as possible that supports the quality-of-service requirements of the request).

Regarding claim 13, Bertin discloses *wherein each of the plurality of routing trees comprises at least a portion of the plurality of switches and corresponding plurality of links that form a shortest path from one of the plurality of end nodes to a spine node of the network* (Bertin: lines 41 - 44, column 14).

Regarding claim 14, Bertin discloses *a network comprising a computer-readable medium containing computer instructions for instructing a processor to perform a method of forwarding a packet, wherein the packet is created at a source and is addressed to a destination within the network* (Bertin: lines 17-26, column 8 – once the optimum paths through the network are calculated, based on a set of quality of service specifications, so that minimum network resources are used, the header of the packets is generated in the node), *the instructions comprising*:

executing a rearrangement algorithm for the network (Bertin: Figure 7 - all the predetermined paths, corresponds to a specific destination, are extracted from the Path Table one at a time. If the characteristics of a path satisfy the request, the path is selected if its entire links provide enough bandwidth. Moreover, the shortest route, with dedicated bandwidth, is chosen from the selected paths);

assigning one of a plurality of Destination Location Identifiers (DLID) to the packet (Bertin: lines 17 - 22 column 8 – the optimum path is put in the header of the packet); and

the packet follows a path through at least a portion of a plurality of switches from the source to the destination (Bertin: lines 10 - 16 column 8 – the packet is routed according to the information in the header).

However, Bertin does not explicitly disclose the feature:

the forwarding instructions create paths appropriate to make the network operate as a strictly non-interfering network.

Schwartz et al. discloses an apparatus and method for forwarding packets of data comprising the feature:

the forwarding instructions create paths appropriate to make the network operate as a strictly non-interfering network (Schwartz: see "With this background, the binary search…comparison trees is not constrained as described above" in column 20, line 15 through column 23, line 30; see also Figure 4 and "A functional block diagram of a switch plane…output port modules at any point in time" in column 11, lines 6 – 50).

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the system of Bertin et al. by using the feature, as taught by Schwartz, in order to allow all the input packet modules to transfer packets to any of the

output port modules at any point in time, and effectively make the inter-port packet switch non-blocking (Schwartz: see column 11, lines 45 – 50).

Regarding claim 17, Bertin discloses *wherein the packet following the path comprises looking up the one of the plurality of DLIDs assigned to the packet in a forwarding table at each of the portion of the plurality switches along the path from the source to the destination* (Bertin: lines 28 - 29 column 7 – routing decisions are made according to the information contained in the header of the data packets).

Regarding claim 18, Bertin discloses *wherein the packet following the path comprises each of the portion of the plurality of switches forwarding the packet in accordance with the one of the plurality of DLIDs assigned to the packet as found in the forwarding table at each the portion of the plurality of switches* (Bertin: lines 28 - 29, column 7 – incoming data packet is forwarded according to the routing information contained in the header of the packet).

Regarding claim 19, Bertin discloses a *network, comprising:*

a master subnet manager, wherein the master subnet manager is coupled to provide network topology data (Bertin: Figure 5, a topology database)*;*

a plurality of source end nodes (Bertin: see Figure 2 High Speed Packet Switching Network 200 and Figure 3); *and*

a connection controller (Bertin: Figure 1, access node)*, wherein the connection controller is coupled to determine an actual traffic pattern for packets to be transmitted non-interferingly from the plurality of source end nodes based on a requested traffic pattern of the packets and the network topology data received* (Bertin: lines 50-52 column 11 – a path and a set of requests for each link of the path are determined using parameters provided by the Topology Database; Figure 7 - all the predetermined paths, corresponds to a specific destination, are extracted from the Path Table one at a time. If the characteristics of a path satisfy the request, the path is selected when all the links in the path provide enough bandwidth. The shortest route, with dedicated bandwidth, is chosen from the selected paths. The predetermined paths are calculated based on the topology information stored in the topology database) *and communicate the actual traffic pattern to the plurality of source end nodes* (Bertin: lines 53 - 65 column 11 - connection request is used to reserve bandwidth on every nodes (origin, transit, and destination) in the path. The transit and destination nodes answer the source/request by sending back either a call acceptance or a call reject).

However, Bertin does not explicitly disclose the feature:

such that the network operates as a strictly non-interfering network.

Schwartz et al. discloses an apparatus and method for forwarding packets of data comprising the feature:

such that the network operates as a strictly non-interfering network (Schwartz: see "With this background, the binary search…comparison trees is not constrained as described above" in column 20, line 15 through column 23, line 30; see also Figure 4 and "A functional block diagram of a switch plane…output port modules at any point in time" in column 11, lines 6 – 50).

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the system of Bertin et al. by using the feature, as taught by Schwartz, in order to allow all the input packet modules to transfer packets to any of the output port modules at any point in time, and effectively make the inter-port packet switch non-blocking (Schwartz: see column 11, lines 45 – 50).

Regarding claim 20, Bertin discloses *wherein the connection controller comprises a packing algorithm, wherein the packing algorithm utilizes the requested traffic pattern and the network topology data to compute the actual traffic pattern* (Bertin: Figure 7 - all the predetermined paths, corresponds to a specific destination, are extracted from the Path Table one at a time. If the characteristics of a path satisfy the request, the path is selected when all the links contain enough bandwidth. The shortest route, with dedicated bandwidth, is chosen from the selected paths. The predetermined paths are calculated based on the topology information stored in the topology database).

Regarding claim 21, Bertin discloses *wherein the network further comprises a plurality of switches* (Bertin: Figure 2), *and wherein the connection controller:*

calculates a plurality of routing trees for the plurality of switches (Bertin: Figure 9, line 51 column 19 to line 29 column 20; Figure 10, line 32 column 20 to line 4 column 21; and Figure 11, lines 7-33 column 21. The Routing Database and the Topology Database are scanned periodically for identifying new paths or for updating existing ones);

calculates a plurality of Destination Location Identifiers (DLID) and a set of forwarding instructions for each of the plurality of switches (Bertin: line 59 column 12 to line 23 column 13 – Equivalent Capacity of the network connection is first computed. Next, all potential paths through the network, based on the information stored in the Topology Database, are determined. The algorithm constructs the new potential path by adding one link at a time and ensuring that the bandwidth and quality of services requirements are still met)*, wherein each of the plurality of DLIDs corresponds to one of the plurality of routing trees and one of a plurality of destinations in the network* (Bertin: lines 37-39 column 13 – each entry in the table represents a path, between a source node and a destination node, that satisfies specific quality of service and traffic requirements); *and*

populates a forwarding table of each of the plurality of switches in the network with the plurality of DLIDs and the set of forwarding instructions (Bertin: line 54 column 18 to line 26 column 19 – paths and their corresponding link information are stored in

the Path Table and Link Table respectively. The Path Table and Link Table are both part of Routing Database).

Regarding claim 22, Bertin discloses *wherein computing an actual traffic pattern comprises executing a rearrangement algorithm* (Bertin: Figure 7 - all the predetermined paths, corresponds to a specific destination, are extracted from the Path Table one at a time. If the characteristics of a path satisfies the request, the path is selected if all its links provide enough bandwidth; furthermore, the shortest route, with dedicated bandwidth, is chosen from the selected paths) *and assigning one of a plurality of Destination Location Identifiers (DLID) to the packet* (Bertin: Figure 4, Path Table (410) – the selected path, with dedicated bandwidth, contains at least the destination node and the selected path).

However, Bertin does not explicitly disclose the feature:

such that the network operates as a strictly non-interfering network.

Schwartz et al. discloses an apparatus and method for forwarding packets of data comprising the feature:

such that the network operates as a strictly non-interfering network (Schwartz: see "With this background, the binary search…comparison trees is not constrained as described above" in column 20, line 15 through column 23, line 30; see also Figure 4

and “A functional block diagram of a switch plane…output port modules at any point in time” in column 11, lines 6 – 50).

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the system of Bertin et al. by using the feature, as taught by Schwartz, in order to allow all the input packet modules to transfer packets to any of the output port modules at any point in time, and effectively make the inter-port packet switch non-blocking (Schwartz: see column 11, lines 45 – 50).

Regarding claim 23, Bertin discloses *wherein the network further comprises a plurality of switches* (Bertin: Figure 2), *wherein*

the packet follows a path through at least a portion of the plurality of switches in the network (Bertin: lines 26 - 27, column 7 – incoming data packets are selectively routed onto the outgoing Trunks towards neighboring nodes), *and wherein*

each of the portion of the plurality of switches forwards the packet according to the one of the plurality of DLIDs assigned to the packet (Bertin: lines 28 - 29, column 7 – incoming data packet is forwarded according to the routing information contained in the header of the packet; Figure 7 - all the predetermined paths, corresponds to a specific destination, are extracted from the Path Table one at a time. If the characteristics of a path satisfy the request, the path is selected when all the links in the path provide enough bandwidth. The shortest route, with dedicated bandwidth, is chosen from the

selected paths. The predetermined paths are calculated based on the topology information stored in the topology database).

However, Bertin does not explicitly disclose the feature:

such that the network operates as a strictly non-interfering network.

Schwartz et al. discloses an apparatus and method for forwarding packets of data comprising the feature:

such that the network operates as a strictly non-interfering network (Schwartz: see “With this background, the binary search…comparison trees is not constrained as described above” in column 20, line 15 through column 23, line 30; see also Figure 4 and “A functional block diagram of a switch plane…output port modules at any point in time” in column 11, lines 6 – 50).

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the system of Bertin et al. by using the feature, as taught by Schwartz, in order to allow all the input packet modules to transfer packets to any of the output port modules at any point in time, and effectively make the inter-port packet switch non-blocking (Schwartz: see column 11, lines 45 – 50).

Regarding claim 24, Bertin discloses *wherein each of the portion of the plurality of switches looks up the one of the plurality of DLIDs assigned to the packet in a*

forwarding table (Bertin: lines 28 - 29 column 7 – routing decisions are made according to the information contained in the header of the data packets).

Regarding claim 25, Bertin discloses *wherein each of the portion of the plurality of switches forwards the packet in accordance with the one of the plurality of DLIDs assigned to the packet as found in a forwarding table* (Bertin: lines 26 - 27, column 7 – incoming data packet is forwarded according to the routing information contained in the header of the packet).

Regarding claim 27, Bertin discloses *further comprising*

a plurality of switches (Bertin: see Figure 2); *and*

a plurality of destination end nodes (Bertin: see Figures 1 and 2), *wherein each of the plurality of source end notes transmits at least one the packets toward at least one of the plurality of destination end nodes via at least one of the plurality of switches* (Bertin: lines 26 - 27, column 7 – incoming data packets are selectively routed onto the outgoing Trunks towards neighboring nodes);

the connection controller determines the requested traffic pattern based on the plurality of source end nodes and the plurality of destination end nodes (Bertin: lines 50-52 column 11 – a path and a set of requests for each link of the path are determined using parameters provided by the Topology Database; Figure 7 - all the predetermined paths, corresponds to a specific destination, are extracted from the Path Table one at a time. If the characteristics of a path satisfy the request, the path is selected when all the

links in the path provide enough bandwidth. The shortest route, with dedicated bandwidth, is chosen from the selected paths. The predetermined paths are calculated based on the topology information stored in the topology database).

However, Bertin does not explicitly disclose the feature:

the actual traffic pattern defines a sub-network that communicates the plurality of source end nodes with the plurality of destination end nodes non-interferingly via at least one of the plurality of switches.

Schwartz et al. discloses an apparatus and method for forwarding packets of data comprising the feature:

the actual traffic pattern defines a sub-network that communicates the plurality of source end nodes with the plurality of destination end nodes non-interferingly via at least one of the plurality of switches. (Schwartz: see "With this background, the binary search…comparison trees is not constrained as described above" in column 20, line 15 through column 23, line 30; see also Figure 4 and "A functional block diagram of a switch plane…output port modules at any point in time" in column 11, lines 6 – 50).

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the system of Bertin et al. by using the feature, as taught by Schwartz, in order to allow all the input packet modules to transfer packets to any of the

output port modules at any point in time, and effectively make the inter-port packet switch non-blocking (Schwartz: see column 11, lines 45 – 50

Regarding claim 31, Bertin discloses *a network comprising a computer-readable medium containing computer instructions for instructing a processor to perform a method of populating a forwarding table, the instructions comprising*:

determining a sub-network for packets to be transmitted non-interferingly from a plurality of source end nodes based on a requested traffic pattern of the packets and network topology data received (Bertin: lines 50-52 column 11 – a path and a set of requests for each link of the path are determined using parameters provided by the Topology Database; Figure 7 - all the predetermined paths, corresponds to a specific destination, are extracted from the Path Table one at a time. If the characteristics of a path satisfy the request, the path is selected when all the links in the path provide enough bandwidth. The shortest route, with dedicated bandwidth, is chosen from the selected paths. The predetermined paths are calculated based on the topology information stored in the topology database), *including*:

calculating a plurality of routing trees for a plurality of switches (Bertin: Figure 9, line 51 column 19 to line 29 column 20; Figure 10, line 32 column 20 to line 4 column 21; and Figure 11, lines 7-33 column 21. The Routing Database and the Topology Database are scanned periodically for identifying new paths or for updating existing ones);

calculating a plurality of Destination Location Identifiers (DLID) and a set of forwarding instructions for each of the plurality of switches (Bertin: line 59 column 12 to line 23 column 13 – Equivalent Capacity of the network connection is first computed. Next, all potential paths through the network, based on the information stored in the Topology Database, are determined. The algorithm constructs the new potential path by adding one link at a time and ensuring that the bandwidth and quality of services requirements are still met), *wherein each of the plurality of DLIDs corresponds to one of the plurality of routing trees and one of a plurality of end nodes* (Bertin: lines 37-39 column 13 – each entry in the table represents a path, between a source node and a destination node, that satisfies specific quality of service and traffic requirements); *and*

populating the forwarding table of each of the plurality of switches in the network with the plurality of DLIDs and the set of forwarding instructions (Bertin: line 54 column 18 to line 26 column 19 – paths and their corresponding link information are stored in the Path Table and Link Table respectively. The Path Table and Link Table are both part of Routing Database); *and*

communicating a path of the sub-network to the plurality of source end nodes (Bertin: lines 53 - 65 column 11 - connection request is used to reserve bandwidth on every nodes (origin, transit, and destination) in the path. The transit and destination nodes answer the source/request by sending back either a call acceptance or a call reject).

However, Bertin does not explicitly disclose the feature:

wherein the forwarding instructions create paths appropriate to make the sub-network operate as a strictly non-interfering network.

Schwartz et al. discloses an apparatus and method for forwarding packets of data comprising the feature:

wherein the forwarding instructions create paths appropriate to make the sub-network operate as a strictly non-interfering network (Schwartz: see "With this background, the binary search...comparison trees is not constrained as described above" in column 20, line 15 through column 23, line 30; see also Figure 4 and "A functional block diagram of a switch plane...output port modules at any point in time" in column 11, lines 6 – 50).

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the system of Bertin et al. by using the feature, as taught by Schwartz, in order to allow all the input packet modules to transfer packets to any of the output port modules at any point in time, and effectively make the inter-port packet switch non-blocking (Schwartz: see column 11, lines 45 – 50).

Regarding claim 34, Bertin discloses *wherein calculating the plurality of routing trees comprises for each spine node in the network* (Bertin: Figure 9, lines 51 column 19 to line 29 column 20; Figure 10, line 32 column 20 to line 4 column 21; and Figure 11, lines 7-33 column 21. The Routing Database and the Topology Database are scanned

periodically for identifying new paths or for updating existing ones), *calculating a shortest path from the spine node to each of the plurality of end nodes* (Bertin: lines 41 - 44 column 14 – a path is calculated with as few links as possible that supports the quality-of-service requirements of the request).

Regarding claim 35, Bertin discloses *wherein each of the plurality of routing trees comprises at least a portion of the plurality of switches and corresponding plurality of links that form a shortest path from one of the plurality of end nodes to a spine node of the sub-network* (Bertin: lines 41 - 44, column 14).

3. Claim 11 and 33 are rejected under 35 USC 103(a) as being unpatentable over Bertin et al. (US 6,400,681 B1)) in view of Schwartz et al. (US 6,421,342 B1) and further in view of Brahmaroutu (US 2003/0033427 A1).

Regarding claim 11, Bertin discloses each of the plurality of end nodes comprises a destination (Bertin: lines 52-53 column 5 – each node comprises one or more communication devices for receiving or transmitting data packets).

However, Bertin does not explicitly disclose the feature:

wherein the destination is identified by a BaseLID.

Brahmaroutu discloses the feature:

wherein the destination is identified by a BaseLID (Brahmaroutu: page 4, section 31 - every switch and each port may have one or more Local Identifiers (LIDs)).

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the system of Bertin et al. by using the features, as taught by Brahmaroutu, in order to allow multiple identifiers.

Regarding claim 33, Bertin discloses each of the plurality of end nodes comprises a destination (Bertin: lines 52-53 column 5 – each node comprises one or more communication devices for receiving or transmitting data packets).

However, Bertin does not explicitly disclose the feature:

wherein the destination is identified by a BaseLID.

Brahmaroutu discloses the feature:

wherein the destination is identified by a BaseLID (Brahmaroutu: page 4, section 31 - every switch and each port may have one or more Local Identifiers (LIDs)).

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the system of Bertin with Schwartz, by using the features, as taught by Brahmaroutu, in order to allow multiple identifiers.

4. Claims 8, 10, 16, 26, 28, 29, and 32 are rejected under 35 USC 103(a) as being unpatentable over Bertin et al. (US 6,400,681 B1)) in view of Schwartz et al. (US 6,421,342 B1) and further in view of Karp (5,469,154).

Regarding claim 8, Karp discloses wherein the network is a Clos network (Karp: see "Multi-stage switching…a signal input pot" in Abstract).

It would have been obvious to one of ordinary skill in the art at the time of the invention modify the system of Bertin with Schwartz, by using the feature, as taught by Karp in order to provide a wide-sense non-blocking connecting path between input and output ports (Karp: see Abstract).

Regarding claim 10, Karp discloses wherein the network is a Clos network (Karp: see "Multi-stage switching…a signal input pot" in Abstract).

It would have been obvious to one of ordinary skill in the art at the time of the invention modify the system of Bertin with Schwartz, by using the feature, as taught by Karp in order to provide a wide-sense non-blocking connecting path between input and output ports (Karp: see Abstract).

Regarding claim 16, Karp discloses wherein the network is a Clos network (Karp: see "Multi-stage switching…a signal input pot" in Abstract).

It would have been obvious to one of ordinary skill in the art at the time of the invention modify the system of Bertin with Schwartz, by using the feature, as taught by Karp in order to provide a wide-sense non-blocking connecting path between input and output ports (Karp: see Abstract).

Regarding claim 26, Karp discloses wherein the network is a Clos network (Karp: see "Multi-stage switching…a signal input pot" in Abstract).

It would have been obvious to one of ordinary skill in the art at the time of the invention modify the system of Bertin with Schwartz, by using the feature, as taught by Karp in order to provide a wide-sense non-blocking connecting path between input and output ports (Karp: see Abstract).

Regarding claim 28, Karp discloses *wherein the sub-network has a characteristic of a Clos networ*k (Karp: see "Multi-stage switching…a signal input pot" in Abstract).

It would have been obvious to one of ordinary skill in the art at the time of the invention modify the system of Bertin with Schwartz, by using the feature, as taught by Karp in order to provide a wide-sense non-blocking connecting path between input and output ports (Karp: see Abstract).

Regarding claim 29, Karp discloses *wherein the characteristic is strictly non-blocking* (Karp: see “Multi-stage switching…a signal input pot” in Abstract).

It would have been obvious to one of ordinary skill in the art at the time of the invention modify the system of Bertin with Schwartz, by using the feature, as taught by Karp in order to provide a wide-sense non-blocking connecting path between input and output ports (Karp: see Abstract).

Regarding claim 30, Karp discloses *wherein the characteristic is rearrangably non-blocking* (Karp: see “Multi-stage switching…a signal input pot” in Abstract).

It would have been obvious to one of ordinary skill in the art at the time of the invention modify the system of Bertin with Schwartz, by using the feature, as taught by Karp in order to provide a wide-sense non-blocking connecting path between input and output ports (Karp: see Abstract).

Regarding claim 32, Karp discloses *wherein the sub-network has a characteristic of a Clos network* (Karp: see “Multi-stage switching…a signal input pot” in Abstract).

It would have been obvious to one of ordinary skill in the art at the time of the invention modify the system of Bertin with Schwartz, by using the feature, as taught by Karp in order to provide a wide-sense non-blocking connecting path between input and output ports (Karp: see Abstract).

Response to Arguments

Regarding claim 1, the applicant argued, as in page 18, that "Schwartz cannot teach or suggest the claimed strictly non-interfering network".

In response, the examiner respectfully disagrees with the above argument. As applicant had cited from the specification (page 5, lines 5 – 11), in page 16, that "a strictly non-interfering network" is a network for which" the only queuing delays experienced by an admissible traffic pattern are attributable to the multiplexing of packets from slow links onto a faster link whose aggregate bandwidth at least equals the sum of the bandwidths of the smaller links. In a strictly non-interfering network, competing traffic sources do not attempt to use the same network resources at the same time. The implementation of a strictly non-interfering network requires that resources be dedicated through the network in support of an active communication

session. In order to accomplish this, non-blocking networks can be used". However, the cited section (page 5, lines 5 – 11) is irrelevant with respect to the rejected claim 1, because the argued features are not recited in the claim. Therefore, the examiner is taking the broadest interpretation and consider a non-blocking network can be used to accomplish a strictly non-interfering network.

Bertin discloses a method and system for minimizing the time to establish a connection between an origin and a destination node in a high speed packet. Once a connection is established, the bandwidth is reserved or dedicated to the connection (Bertin: column 11, lines 53 – 63). In addition, Schwartz discloses an apparatus and method for forwarding packets of data across a switching node on a network that can be effectively be non-blocking (Schwartz: column 11, lines 45 – 50). The combination of Bertin and Schwartz discloses the features comprising once a connection is established, resources are dedicated and they do not attempt to use the same network resources at the same time. In addition, the network can be configured as a non-blocking network which can be used as a strictly non-interfering network.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JUVENA LOO whose telephone number is (571)270-1974. The examiner can normally be reached on Monday - Friday: 7:30am-4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kwang Yao can be reached on (571) 272-3182. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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/Hanh Nguyen/
Primary Examiner, Art Unit 2416

/JUVENA LOO/
Examiner
Art Unit 2416
February 13, 2009